CAN Interfaces

Overview PC/CAN Interfaces

The IXXAT PC/CAN interfaces enable PC applications to access CAN networks with a singular variety of different PC interface standards. The customer can select an optimum PC/CAN interface according to the application, performance requirement or required unit costs. More than 10 different PC interface standards are supported, and for many of which, we offer several different CAN boards. The complete IXXAT PC/CAN interface product range was developed, and will continue to be developed exclusively by IXXAT, so that we can maintain complete control over production, product maintenance and product life cycle. This criterion is an important one, especially in the industrial sector that values the longevity of its products. Today, function-compatible alternatives still exist, even for boards already developed in 1990. Almost all boards are available from stock and can be supplied within a short time frame.

Despite the wide variety of PC/CAN interfaces, all IXXAT interfaces can be operated with the hardware-independent, common VCI driver (Virtual CAN Interface). Therefore, it is very easy to switch between CAN boards. Even future technologies are already being "integrated" today.

OVERVIEW PC/CAN INTERFACES

Cardname	Technic	PC-access	Microcontrollersystem	CAN Controller	Bus interface	Certification
Passive CAN Interfaces						
PC-I 04/PCI	PCI	Memory mapped	passiv	up to 2 x SJA 1000	High-Speed	CE, CSA/UL
PC-I 04/104	PC/104	Memory mapped	passiv	up to 2 x SJA 1000	High-Speed	CE, CSA/UL
Aktive CAN Interfaces						
iPC-I 320/PCI II	PCI	DPRAM memory mapped	8 Bit	up to 2 x SJA 1000	High-Speed	CE, CSA/UL, FCC
iPC-I 320/104	PC/104	DPRAM memory mapped	8 Bit	1 x SJA 1000	High-Speed	CE, CSA/UL
iPC-I XC16/PCI	PCI (3,3 V and 5 V)	DPRAM memory mapped	16 Bit	1 x TwinCAN (2 x CAN)	High-Speed and optional Low-Speed (switchable via software)	CE, CSA/UL, FCC
iPC-I XC16/PCIe	PCI express	DPRAM memory mapped	16 Bit	1 x TwinCAN (2 x CAN)	High-Speed	CE, FCC
iPC-I XC16/PMC	PMC	DPRAM memory mapped	16 Bit	1 x TwinCAN (2 x CAN)	Switchable High/Low speed interface	CE, FCC
iPC-I 165	ISA	DPRAM memory mapped	16 Bit	up to 2 x SJA 1000	High-Speed	CE, CSA/UL
CAN@net II/VCI	Ethernet	10/100 MBit/s Ethernet	32 Bit	1 x SJA 1000	High-Speed	CE, FCC, CSA/UL

Cardname	Technic	PC-access	Microcontrollersystem	CAN Controller	Bus interface	Certification
Mobile CAN Interfaces						
tinCAN 161	PCMCIA	DPRAM memory mapped	16 Bit	2 x SJA 1000	High-Speed and Low-Speed	CE
USB-to-CAN II	USB V2.0 (full speed)	USB	16 Bit	2 x SJA 1000	High-Speed and Low-Speed	CE, CSA/UL, FCC
USB-to-CAN compact	USB V2.0 (full speed)	USB	16 Bit	1 x SJA 1000	High-Speed	CE, CSA/UL, FCC
CANblue/VCI	Bluetooth	Bluetooth	16 Bit	1 x SJA 1000	High-Speed	CE

For custom applications requiring fully integrated PC/CAN interfaces, we also offer hardware and software licensing of our interface technologies.

QUALITY OF OUR HARDWARE

IXXAT is certified according to ISO 9001:2000. Our goal is to guarantee the high quality of the products that we provide to our customers. Therefore, all IXXAT CAN boards are tested 100 %, i.e., every single board is checked "with a fine-tooth comb" before it leaves our company.

CE CERTIFICATION AND CSA APPROVAL

The IXXAT PC/CAN interface boards fulfill the currently valid EMC directive 89/336/EEC and are CE-certified in accordance with the following standards (these can vary according to the interface used, see manual):

- EN 61000-6-2 (immunity, industrial interference immunity)
- EN 61000-4-2 (air discharge 8kV, contact discharge 4kV)
- EN 61000-4-3 (electromagnetic field compatibility 80MHz-1GHz, 10V/m)
- EN 61000-4-4 (transient distortion factor, burst, bus line1kV)
- EN 61000-4-6 (HF current compatibility 150kHz-80MHz, 10V)
- EN 55022 (class B, interference emission, trade and small industrial sector)

In addition, almost all IXXAT PC/CAN interface boards have CSA approval for USA and Canada (equivalent to UL approval).

ROHS AND WEEE

On 27th January 2003, binding European directives were agreed upon for the restriction of hazardous substances – these took effect permanently on July 1, 2006.
The main aim of the directive is to restrict substances that are harmful to both the environment and to one's health. This regulation directly affects the following materials: lead, cadmium, hexavalent chrome, mercury, PBB (polybrominated biphenyls), PBDE (polybrominated diphenyl ethers).

RoHS

Since July 1, 2006, IXXAT has delivered all products in accordance with the RoHS directive. Products for which conversion was not possible have been discontinued. Whenever possible, IXXAT has provided replacement products for all discontinued products, making the transition as seamless as possible.

ElektroG (WEEE)

According to the EU law, IXXAT is registered at the EAR foundation in Fürth. Because of this, all IXXAT components which are distributed exclusively in the B2B area were registered.

Our registration number at EAR: 29724241

SUPPORTED PHYSICAL CAN BUS STANDARDS

High Speed bus connection according to ISO 11898-2

All CAN boards are available as standard with an on-board CAN bus interface according to ISO 11898-2 (high-speed). The Philips 82C251 or the Texas Instruments SN65HVD251 chip is used as the transceiver. Connection to the CAN network is generally made via a Sub-D-9 plug-in connector according to CiA-DS102. Versions with alternative plug-in connectors (e.g. RJ45) can be supplied on request.

Selected CAN boards can be equipped with alternative CAN bus interfaces in the form of a piggyback board or as a separate assembly option for each CAN channel.

Other available bus connections are:

Low-speed bus connection (fault-tolerant) according to ISO 11898-3

For some CAN boards, a CAN low-speed bus connection based on the CAN transceiver TJA 1054 is available either as an option or is integrated and activated by software.

GALVANIC ISOLATION

The CAN bus connection is available as an option with galvanic isolation. Galvanic isolation is achieved by means of opto couplers or magnet couplers and DC/DC converters on the board, and therefore, does not require an external power supply.

ACTIVE AND PASSIVE CAN INTERFACES

CAN boards can basically be divided into two groups:

Passive CAN boards

These boards require direct access of the PC driver to the CAN controller of the board. The PC must configure and operate the CAN controller.

Active ("intelligent") CAN boards

These boards have an independent microcontroller system. In addition to configuration of the CAN controller, the microcontroller can also perform time-critical tasks such as the transmission, reception and filtering of CAN messages, can provide received messages with time-stamps, and, can process higher protocols such as CANopen or DeviceNet.

Today PCs are at least 100 times faster than the microcontrollers used on the CAN boards. Nevertheless, the use of CAN boards with their own microcontrollers makes sense because of the following two consideration:

- CAN controllers have only very limited buffering capacities for received messages. In the worst case, a CAN message is received approx. every 50 µs. Depending on the CAN controller used, only a few or only one message can be buffered. This results in a high real-time requirement of the host PC for the reaction of the CAN interrupt which must always be guaranteed in order to prevent a loss of messages.

- The very short processing time for reading out and passing on a CAN message (copying of approx. 12 bytes) is a contrast to the slow context switch of the PC operating system which is triggered by a CAN interrupt. Despite its excellent processing power, this quickly results in a very high load for the PC.

Especially for non-deterministic operating systems such as Microsoft Windows, these aspects can cause a problem with high transmission rates and/or high levels of data traffic. By using powerful active CAN boards, the load on the PC can be relieved or the time-critical requirements can be reduced. For applications with higher requirements in terms of data traffic and deterministic processing of the CAN messages, the use of active boards is always recommended, since variable factors such as the performance of the PC, the number and type of additionally installed boards and drivers and the number of executed programs (e.g. hard disk accesses) do not guarantee a deterministic access to CAN networks.

Active CAN boards also offer the following additional advantages:

- By pre-filtering CAN messages already on the CAN board, only relevant messages are forwarded to the PC. Since messages are no longer filtered by the PC program, the interrupt load of the PC decreases.

- With the VCI, independent cyclic transmission of CAN messages by the microcontroller is supported. CAN messages can be transmitted on CAN networks under real-time conditions independent of the PC.

If, on the other hand, the PC is only to be used for the configuration of CAN components, for example, which is generally carried out via a small number of CAN messages, the performance of a passive board is completely sufficient.

The active CAN boards from IXXAT are available with various microcontrollers. The standard CAN boards are equipped with the 8-bit MC DALLAS DS80C320. This microcontroller belongs to the 8051 family but has three times faster command processing and is clocked with 22 MHz. For most applications with low to medium average message rates such as applications based on the VCI-CAN driver, these CAN boards are also sufficient.

For applications with higher requirements on the communication process, IXXAT supplies active CAN boards with 16-bit microcontrollers of the Infineon C16x or XC family. Due to the larger memory and higher execution speed, even two CAN networks with high baudrate and high bus load can be operated and monitored. These boards can also perform the function of a CANopen master, even for networks with many nodes.

SOFTWARESUPPORT

IXXAT supports its CAN boards with a wide variety of powerful software packages. In addition to the standard CAN driver software, these also include development, analysis and configuration tools, as well as program libraries for higher layer protocols.

CAN drivers for Windows

The delivery specification of every IXXAT CAN board includes the universal CAN driver "Virtual CAN Interface" (VCI) for Windows 2000/XP. This powerful CAN driver package supports all CAN boards (also passive boards), regardless of their PC interface, with a uniform programming interface (API). This means that applications based on VCI-API can be used with all IXXAT CAN boards without modifying the application program.
The VCI CAN driver also contains a simple CAN bus monitor which enables transmission and reception of CAN objects in a CAN system.

As is typical with Windows, the IXXAT CAN boards are installed conveniently and safely via the Windows device manager.

VxWorks and Linux

For the VxWorks and Linux operating systems, IXXAT provides the BCI driver (Basic CAN Interface). The BCI supports the active and passive (only Linux) ISA and PCI boards.

CAN-OPC-Server

The CAN-OPC server enables simple connection of OPC clients (SCADA programs) to CAN systems. As the CAN-OPC server works on CAN layer 2, it can be used with various CAN-based protocols in the automotive and automation sectors.

LabView and LabWindows

For the standard visualization interfaces LabView and LabWindows, IXXAT provides free, fully functional integration examples based on the VCI CAN driver. Here, all important functions for transmitting and receiving CAN messages are fully supported. The IXXAT CAN interface boards can be operated directly under LabView and LabWindows with minimal adaptation work. If required, the integration examples can be quickly adapted to specific customer requirements.

CANopen

The CANopen Master API enables PC access to CANopen systems via the active CAN boards from IXXAT (PCI, USB, PC104, ISA, PCMCIA). Based on this software package, powerful Windows based control, test and service programs can be developed quickly and easily.

SOFTWARESUPPORT

Interface board	VCI Driver for Windows	BCI for Linux and VxWorks	OPC-Server	CANopen	Labview / Lab-Windows	IXXAT Tools	32 Bit Driver for ODVA Conformance Test SW
Passive CAN Interfaces							
PC-I 04/PCI	2000, XP	x/–	x	–	x/x	x	–
PC-I 04/104	in preparation	x/–	x	–	in preparation	x	–
Active CAN Interfaces							
iPC-I 320/PCI II	2000, XP	x/x	x	x	x/x	x	x
iPC-I 320/104	in preparation	x/x	x	x	in preparation	x	–
iPC-I XC16/PCI	2000, XP	x/–	x	x	x/x	x	–
iPC-I XC16/PCIe	2000, XP	–/–	x	–	x/x	x	–
iPC-I XC16/PMC	2000, XP	x/–	x	x	x/x	x	–
iPC-I 165	–	x/x	x	x	x/x	x	x
CAN@net II	–	via Generic Version (*1)	x	in preparation	in preparation	x	–
Mobile CAN Interfaces							
tinCAN 161	2000, XP	–	x	x	x/x	x	–
USB-to-CAN II	2000, XP	–	x	x	x/x	x	–
USB-to-CAN compact	2000, XP	–	x	x	x/x	x	x
CANblue	–	via Generic Version (*2)	x	–	in preparation	x	–

*1) The Linux- and VxWorks connection is made by a TCP/IP soket interface, which provides all necessary CAN functions.

*2) The connection is made by using Bluetooth SPP communication, which has to be supported by the operating system. The serial ASCII protocol provides all necessary CAN functions.

CAN Driver for Windows (VCI)

Powerful driver software with generic programming interface for all IXXAT PC-CAN interface cards

OVERVIEW

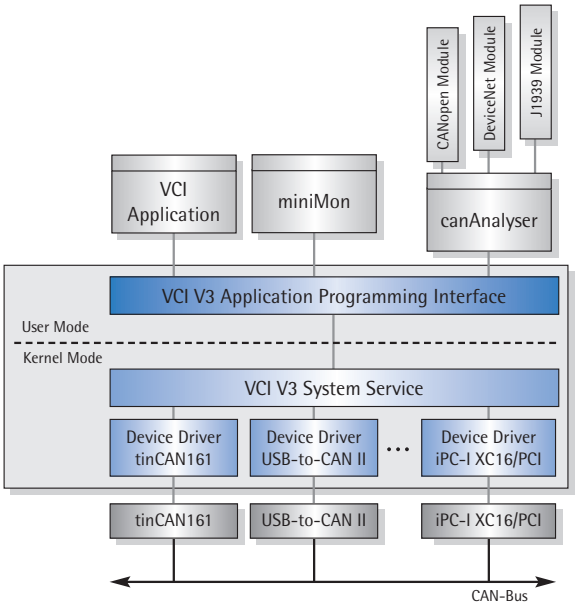
With the VCI, IXXAT presents the third generation of its proven CAN driver based on the successful VCI concept. The driver provides a uniform programming interface that is independent of both the card type and the PC interface technology, and thus allows for the use of all IXXAT CAN cards without having to adapt the application software.

The VCI is designed as a system server and allows simultaneous access of several applications to one or more CAN controllers of one or more PC interfaces. Moving all important functions to the kernel optimizes the real-time-compatibility of the VCI driver.
The user interface is designed as a "C" Port that offers all necessary functions for CAN-based applications. In addition to the "C" Port, the VCI offers a .net API and therefore, can be used with all Windows .net languages and scripts (e.g. C#).

Communication with the CAN interface card occurs via message channels. A message channel consists of one transmit and one receive FIFO. Message channels can be created exclusively or cooperatively. If message channels are created cooperatively for a certain CAN controller, the data of that CAN controller is distributed equally to the various message channels. The receive FIFO of a message channel supports the access methods "event-controlled" and "polling" where a FIFO fill level mark can be defined to trigger an event. In addition, specific message filtering can be carried out for each CAN controller. The CAN messages are read out from the receive FIFO with status and time stamp of the time of reception.

In addition to the standard transmit method, intelligent cards (cards with their own microcontroller system) support extended transmit functions such as the transmission of messages with a time delay, with which the message flow can be controlled via a transmit inhibit time, or cyclic on-board transmission, with which high bus loads and exact cycle times of messages can be generated. Also available are incrementing functions which can alter the transmit data.

The VCI supports a plug & play notification system by which both the insertion and the removal of CAN interfaces is automatically detected and processed. This makes it possible to remove devices while a VCI application is running.



SUPPORT OF LABVIEW

The use of IXXAT CAN interface cards in connection with the test and programming system Labview® from National Instruments is supported by a VI library.

FURTHER FUNCTIONS OF THE VCI-CAN DRIVER

- Convenient card installation via the Windows device manager
- Prepared dialog for selection of the installed cards simplifying integration into the users' applications
- Management functions for start-up and testing of the PC/CAN interface card
- Automatic download of the firmware with active cards directly from the driver, thus making simple firmware updates possible
- Standard (11-bit identifier, CAN 2.0A) and extended protocol (29-bit identifier, CAN 2.0B)
- Detection and display of error frames on the bus
- Measurement and display of the bus load (only with active CAN cards)
- Reception of self-transmitted messages (self-reception), possible operation in "Listen only mode"
- Cyclic transmission of CAN messages (only with active cards)

SIMPLE INSTALLATION OF THE CAN CARDS

The CAN cards are installed in accordance with the Windows standard. During installation, the data of the installed CAN card is entered in the registry.

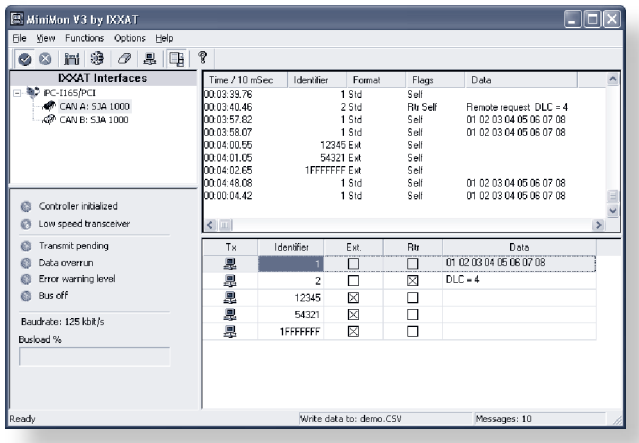
AVAILABLE VERSIONS

The VCI driver version 3 is available for Windows 2000/XP. Older Windows operating systems will be supported by the version 2 of the VCI driver.

It is also possible for CAN cards and CAN modules of other vendors to be supported by the VCI CAN driver. Please ask us if you are interested in this capability.

FREE CAN MONITOR „MINIMON“

For both simple testing purposes and for start-up of the PC interfaces, a free CAN monitor (miniMon) is installed with the VCI. This monitor can be used to display CAN messages with time stamp, message identifiers and data. A logging function enables the data received to be recorded directly to hard disk. CAN messages are transmitted via a list in which CAN messages are entered. Installed interfaces are displayed with the available CAN controllers, the current bus load and the controller status.



CONTENT OF DELIVERY

- VCI
- CAN monitor "miniMon"
- Demo programs in C, C#
- Installation and programming manual

Version 2 of the VCI driver

In addition to the VCI V3 driver, IXXAT continues to offer its proven VCI V2 driver which supports all interfaces listed in the catalog, including those with older operating systems (such as Windows NT/98/Me).

CAN Driver for Linux and VxWorks

CAN Driver for IXXAT ISA, PCI and PC104 CAN boards

OVERVIEW

With the BCI (Basic CAN Interface), selected active and passive ISA, PCI, PC/104 CAN boards from IXXAT are supported under the Linux and VxWorks operating systems. The driver simultaneously supports two CAN channels per CAN board and up to four (also different) CAN boards in one PC. The BCI features a simplified user interface, but, nevertheless, provides all necessary mechanisms for convenient operation of the CAN boards.

Messages are transmitted and received via queues, with a separate transmit and receive queue available for each CAN channel. The messages received can be processed either via interrupts or by polling. For interrupt processing, two different operating modes are available: the "latency" mode enables short reaction times to received messages, while the "throughput" mode guarantees maximum data throughput. If active boards are used, the messages received are already provided with a time-stamp and can be pre-filtered by the CAN interface via programmable software and firmware filters.

The Linux version of the CAN driver is implemented as a loadable kernel module.

FUNCTIONS OF THE CAN DRIVER

- Transmission and reception of CAN messages via queues
- "Polling" or "interrupt" modes optimized to "latency" or "throughput" for receive queues
- Programmable firmware filters for message reception (only on the active boards)
- Programmable software filters in the BCI driver for message reception
- Standard (11-bit identifier, CAN 2.0A) and extended protocol (29-bit identifier, CAN 2.0B)
- Automatic download of firmware directly from the BCI library, simple software updates are thus possible (active boards only)
- Baud rates up to 1 Mbaud
- Support of up to 4 CAN boards with 1 or 2 CAN controllers (Philips SJA1000)

SUPPORTED PC/CAN CARDS

Card	Linux	VxWorks
iPC-I 320/PCI	x	x
iPC-I 320/104	x	x
iPC-I 165 (ISA)	x	x
iPC-I XC16/PCI	x	–
PC-I 04/PCI	x	–
PC-I 04/104	x	–

SUPPORTED OPERATING SYSTEMS

- Linux kernel version 2.4 or higher
- VxWorks

CONTENTS OF DELIVERY

Availability of the product on request
- Driver for Linux or VxWorks as source code
- Sample program in C
- Programming manual

SUPPORT OF OTHER OPERATING SYSTEMS

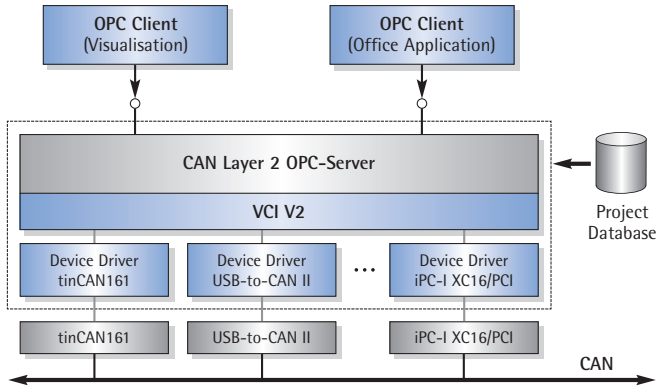
The software structure of the CAN driver is designed for simple adaptation to other operating systems. All OS-specific functions and interfaces are combined centrally in one module, so that the remaining code is OS-independent.

CAN Layer 2 OPC-Server

Standardized Interface for SCADA Programs

OVERVIEW

By using specific hardware interfaces in PC applications (e.g. visualization or control programs), relevant drivers often had to be adapted or created again. The open interface standard OPC represents a data communication interface and considerably simplifies this integration step. OPC stands for "OLE for Process Control" and is based on the Microsoft Windows OLE/COM technology. Many applications, including all common visualization programs (SCADA programs), support the OPC interface.



The OPC server from IXXAT is based on VCI and connects all IXXAT PC/CAN interface cards to SCADA programs. As the OPC server works directly on CAN layer 2, it is not restricted to a certain higher CAN protocol (such as CANopen or DeviceNet) and can be used, in principle, with every standardized or user-specific CAN protocol of the automation and automotive sectors. The data is transmitted between the OPC server and the OPC client on the level of single layer 2 CAN messages.

DESCRIPTION OF THE FUNCTIONS

The data interface of the OPC server is described via a project database, in which the interpretation instructions for the CAN messages are entered with the aid of an editor (also supplied).

The OPC server can also be extended by further filters for data import, allowing for the generation of a project database for a system from existing system descriptions. An import filter for CANopen DCF files is supplied, from which the required additional elements for transmission and reception of CANopen PDOs can be automatically generated. The OPC name space is formed automatically by reading a project database.

The IXXAT CAN layer 2 OPC server fulfills the OPC specification Data Access Version 2.0, although OPC clients are also supported according to specification V1.0 or V1.0a.

The delivery specification also includes a simple OPC client which displays received CAN data and thus allows for simple testing of the OPC server after installation and first steps with the OPC technology.

SYSTEM REQUIREMENTS

- PC with operating system Windows 98, Me, NT(SP5), 2000, XP
- IXXAT CAN interface board with Philips SJA1000
- VCI version 2

CONTENTS OF DELIVERY

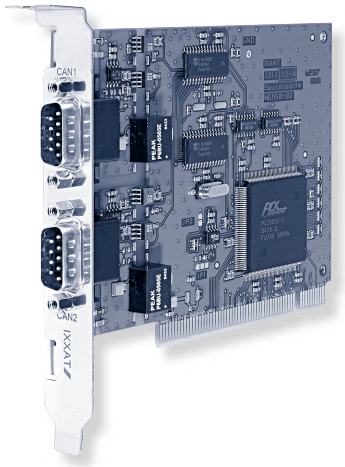
- OPC-Server software with single-user license
- Editor for project database
- Simple OPC client for functional tests
- User manual

ORDER NUMBER

1.02.0170.00000	CAN Layer-2 OPC-Server

PC-I 04/PCI

Passive CAN interface for PCI bus systems



This is a passive board (no microprocessor on board) for the PCI bus with up to two CAN channels. It represents a very economic solution for connecting a PC to a CAN network in applications where there are low performance requirements.

TECHNICAL DATA

PC bus interface	PCI Bus (specification 2.1), 32 Bit, 33MHz, 5V
PC address range	Plug & Play, 1024 bytes memory mapped and 128 bytes I/O area
Interrupts	INT A, Plug & Play
Microcontroller	None
CAN controller	Up to two Philips SJA 1000
CAN bus interface	ISO/IS 11898-2, Sub D9 connector according to DS 102, optional galvanic decoupled
Power supply	5 V DC, 300 mA typ., provided by PC
Temperatur range	-20 °C to +70 °C
Certification	CE, CSA/UL
Size	Approx. 95 x 125 mm

ORDER OPTIONS

- Galvanic decoupling

CONTENTS OF DELIVERY

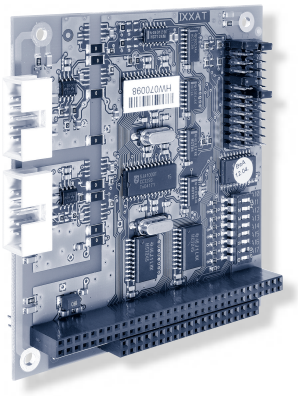
- PC/CAN interface card, manual
- CAN driver VCI for Windows 2000, XP
- Simple CAN monitor "miniMon"

ORDER NUMBER

1.01.0057.10100	PC-I 04/PCI, 1 x SJA1000 CAN controller, 1 x CAN interface
1.01.0057.10200	PC-I 04/PCI, 1 x SJA1000 CAN controller, 1 x CAN interface, 1 x galvanic decoupled
1.01.0057.11110	PC-I 04/PCI, 2 x SJA1000 CAN controller, 2 x CAN interface
1.01.0057.11220	PC-I 04/PCI, 2 x SJA1000 CAN controller, 2 x CAN interface, 2 x galvanic decoupled

PC-I 04/104

Passive CAN interface for PC/104 bus systems



This is a passive CAN board (no microprocessor on board) for the PC/104 bus with up to two CAN channels. It represents a very economic solution for connecting a PC to a CAN network in applications where there are low performance requirements.

TECHNICAL DATA

PC bus interface	PC/104 bus, 8 Bit
PC address range	C000h-FFC0h (memory mapped), adjustable in 1 kB steps
Interrupts	IRQ 3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15 separated for each CAN controller, shared interrupt, edge/level mode
Microcontroller	None
CAN controller	Up to two Philips SJA 1000
CAN bus interface	ISO/IS 11898-2, bent 2 x 5 pin connectors according to DS 102, optional galvanic decoupling
Power supply	5 V DC, 150 mA typ., provided by PC
Temperatur range	-20 °C to +70 °C
Certification	CE, CSA/UL
Size	Approx. 90 x 96 mm

ORDER OPTIONS

- Galvanic decoupling

CONTENTS OF DELIVERY

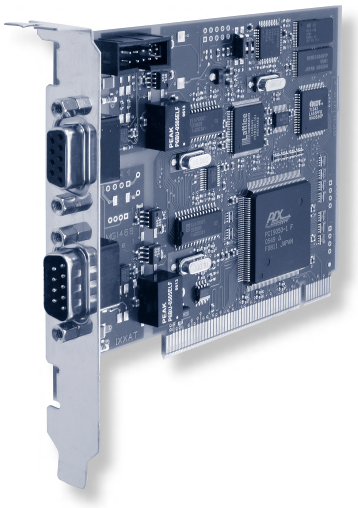
- PC/CAN interface card and manual
- CAN driver VCI for Windows 2000, XP
- Simple CAN monitor "miniMon"

ORDER NUMBER

1.01.0070.10100	PC-I 04/104, 1 x SJA1000 CAN controller, 1 x CAN interface
1.01.0070.10200	PC-I 04/104, 1 x SJA1000 CAN controller, 1 x CAN interface, 1 x galvanic decoupled
1.01.0070.11110	PC-I 04/104, 2 x SJA1000 CAN controller, 2 x CAN interface
1.01.0070.11220	PC-I 04/104, 2 x SJA1000 CAN controller, 2 x CAN interface, 2 x galvanic decoupled

iPC-I 320/PCI II

Intelligent PC/CAN interface for PCI bus systems



This is an active CAN board with one or two CAN channels that is appropriate for use in a wide variety of CAN applications. The interface is cutting-edge because of its support of the PCI bus which allows an installation via Plug & Play. Filtering, preprocessing, and transmission and time stamped storage of the CAN messages are just some of the features offered by the on-board microcontroller. In combination with the universal CAN driver (VCI, part of delivery), the iPC-I 320/PCI II allows an easy integration of PC supported CAN applications. Offering an exceptional combination of functionality and value, it is perfectly suited for high-volume productions. In addition, the iPC-I 320/PCI II is also well-suited for use with the IXXAT analysis and configuration tools.

TECHNICAL DATA

PC bus interface	PCI bus (2.1), 32 Bit, 33 MHz, 5 Volt
PC address range	Plug & Play, 8 kB memory mapped and 128 Bytes I/O-area
Interrupts	INT A, Plug & Play
Microcontroller	Dallas DS80C320, 22.1184 MHz
Memory extension	128 kByte SRAM, 128 kByte Flash, 4 kByte DPRAM
CAN controller	Up to two Philips SJA 1000
CAN bus interface	ISO/IS 11898-2, Sub D9 connector according to DS 102, optional galvanic decoupling
Power supply	5 V DC, 300 mA typ., provided by PC
Temperature range	0 °C to +70 °C
Certification	CE, FCC, CSA/UL
Size	Approx. 124 x 97.5 mm

ORDER OPTIONS

- Galvanic decoupling

CONTENTS OF DELIVERY

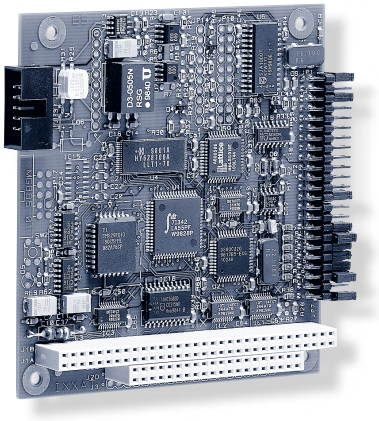
- PC/CAN interface card and manual
- CAN driver VCI for Windows 2000, XP
- Simple CAN monitor "miniMon"

ORDER NUMBER

1.01.0039.10100	iPC-I 320/PCI II, 1 x SJA1000 CAN controller, 1 x CAN interface
1.01.0039.10200	iPC-I 320/PCI II, 1 x SJA1000 CAN controller, 1 x CAN interface, 1 x galvanic decoupled
1.01.0039.11110	iPC-I 320/PCI II, 2 x SJA1000 CAN controller, 2 x CAN interface
1.01.0039.11220	iPC-I 320/PCI II, 2 x SJA1000 CAN controller, 2 x CAN interface, 2 x galvanic decoupled

iPC-I 320/104

▶ Intelligent CAN interface for PC/104 bus systems



This is an active CAN board with one CAN channel that is appropriate for a wide variety of CAN applications. Filtering, preprocessing, transmission and time-stamped storage of the CAN messages are just some of the features offered by the on-board microcontroller. In combination with the universal CAN driver (VCI, part of delivery) the iPC-I 320/104 allows for the easy integration of PC-supported CAN applications. Offering exceptional functionality and value, it is perfectly suited for high-volume productions.

TECHNICAL DATA

PC bus interface	PC/104 bus, 8 bit
PC address range	C000h-FE00h (memory mapped), adjustable in 8 kB steps
Interrupts	IRQ 3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15
Microcontroller	Dallas DS80C320, 22,1184 MHz
Memory extension	2 x 64 kByte SRAM, 2 x 64 kByte Flash, 4 kByte DPRAM
CAN controller	1 x Philips SJA 1000
CAN bus interface	ISO/IS 11898-2, bent 2 x 5 pin connector according to DS 102, optional galvanic decoupling
Power supply	5 V DC, 190 mA typ., provided by PC
Temperature range	-40 °C to +85 °C
Certification	CE, CSA/UL
Size	Approx. 90 x 96 mm

ORDER OPTIONS

- Galvanic decoupled

CONTENTS OF DELIVERY

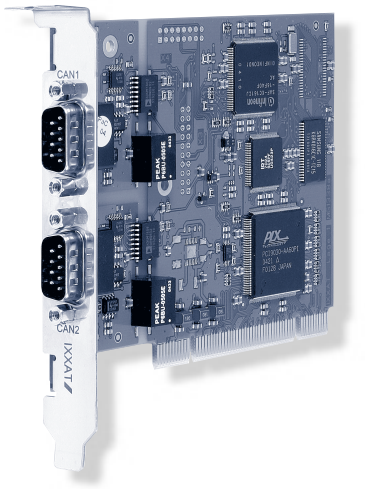
- PC/CAN interface card and manual
- CAN driver VCI for Windows 2000, XP
- Simple CAN monitor "miniMon"

ORDER NUMBER

1.01.0043.10100	iPC-I 320/104, 1 x SJA1000 CAN controller, 1 x CAN interface
1.01.0043.10200	iPC-I 320/104, 1 x SJA1000 CAN controller, 1 x CAN interface, 1 x galvanic decoupled

iPC-I XC16/PCI

Intelligent CAN interface for 5 V and 3.3 V PCI bus systems with optional Low Speed bus interface



Covering a wide range of industrial and automotive CAN applications, this is a powerful and economic solution for an active CAN board with two CAN channels. The interface is state-of-the-art, supports PCI, and can be easily installed by Plug & Play. Some of the features offered by the on-board microcontroller include filtering, preprocessing, transmission and time stamped storage of the CAN messages.
Due to the powerful microcontroller, both CAN controllers can operate simultaneously without losing any data, even in systems with a high bus load. In combination with the CAN driver (VCI, part of delivery), the iPC-I XC16/PCI allows for the seamless integration of PC- supported CAN applications. In addition, the iPC-I XC16/PCI is well-suited for use with the IXXAT analysis and configuration tools and as a CANopen network controller.

TECHNICAL DATA

PC bus interface	PCI-Bus (2.2), 32 Bit / 33 MHz, 5 Volt or 3.3 Volt
PC address range	Plug & Play, 16 kB memory mapped and 128 bytes I/O area
Interrupts	INT A, Plug & Play
Microcontroller	Infineon XC161, 40 MHz
Memory extension	512 kByte SRAM, 128 kByte FLASH, 8 kByte DPRAM
CAN controller	Internal TwinCAN module (two CAN channels)
CAN bus interface	ISO/IS 11898-2 according to DS 102, Sub D9 connector, optional galvanic decoupling and high-/low-speed bus interface (ISO/IS 11898-3) switchable via software
Power supply	5 V DC, 100 mA typ.; 3.3 V DC, 120 mA typ.
Temperature range	-20 °C to +70 °C
Certification	CE, FCC, CSA/UL
Size	Approx. 89 x 124 mm

ORDER OPTIONS

- Galvanic decoupling
- High-/Low-speed interface, switchable via software

CONTENTS OF DELIVERY

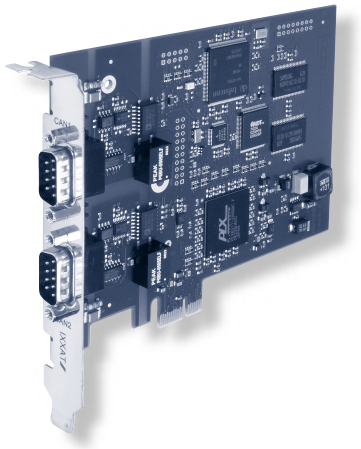
- PC/CAN interface card and manual
- CAN driver VCI for Windows 2000/XP
- Simple CAN monitor "miniMon"

ORDER NUMBER

1.01.0047.33110	iPC-I XC16/PCI, 2 x internal CAN, 2 x CAN interface High-Speed
1.01.0047.33220	iPC-I XC16/PCI, 2 x internal CAN, 2 x CAN interface High-Speed, galvanic decoupled
1.01.0047.33260	iPC-I XC16/PCI, 2 x internal CAN, 2 x CAN interface High/Low-Speed, galvanic decoupled

iPC-I XC16/PCIe

Intelligent CAN interface for PCI express bus systems



This is a powerful and economic solution for an active CAN board with two CAN channels. The interface is state-of-the-art, supports PCI express, and can be easily installed by Plug & Play. Some of the features offered by the on-board microcontroller include filtering, pre-processing, transmission and time-stamped storage of the CAN messages. Due to the powerful microcontroller, both CAN controllers can operate simultaneously without losing any data even in systems with a high bus load. In combination with the CAN driver (VCI, part of delivery), the iPC-I XC16/PCIe allows for the seamless integration of PC- supported CAN applications. In addition, the iPC-I XC16/PCIe is well-suited for use with the IXXAT analysis and configuration tools, and, for use as a CANopen network controller.

TECHNICAL DATA

PC bus interface	PCIe (r1.0a), x1 link (2,5 Gbps per direction)
PC address range	Plug & Play, 16 kB memory mapped and 128 bytes I/O area
Interrupts	INT A, Plug & Play
Microcontroller	Infineon XC161, 40 MHz
Memory extension	512 kByte SRAM, 128 kByte FLASH, 8 kByte DPRAM
CAN controller	Internal TwinCAN module (two CAN channels)
CAN bus interface	ISO/IS 11898-2 high-speed, Sub D9 connector according to DS 102, Galvanic decoupled
Power supply	12 V DC, 60 mA typ.; 3.3 V DC, 200 mA typ.
Temperature range	0 °C to +70 °C
Certification	CE, FCC
Size	Approx. 90 x 150 mm

CONTENTS OF DELIVERY

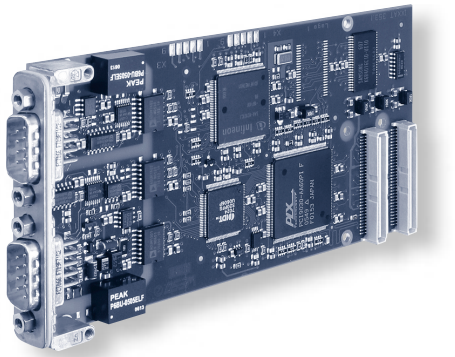
- PC/CAN interface card and manual
- CAN driver VCI for Windows 2000/XP
- Simple CAN monitor "miniMon"

ORDER NUMBER

1.01.0053.33220	iPC-I XC16/PCIe, 2 x internal CAN, 2 x CAN interface High-Speed, 2 x galvanic decoupled

iPC-I XC16/PMC

Intelligent CAN interface for 5 V and 3.3 V PMC bus systems with Low Speed bus interface



Covering a wide range of industrial and automotive CAN applications, this is a powerful and economic solution for an active CAN board with one or two CAN channels. The interface is state-of-the-art, supports PMC and can be easily installed by Plug & Play. Some of the features offered by the on-board microcontroller include filtering, pre-processing, transmission and time-stamped storage of the CAN messages. Due to the powerful microcontroller, both CAN controllers can operate simultaneously without losing any data even in systems with a high bus load. In combination with the CAN driver (VCI, part of delivery), the iPC-I XC16/PMC allows for the seamless integration of PC-supported CAN applications.

TECHNICAL DATA

PC bus interface	PMC Bus (2.2), 32 Bit / 33 MHz, 5 Volt or 3.3 Volt
Memory range	Plug & Play, 16 kB memory mapped and 128 bytes I/O area
Interrupts	INT A, Plug & Play
Microcontroller	Infineon XC161, 40 MHz
On board memory	512 kByte SRAM, 128 kByte FLASH, 8 kByte DPRAM
CAN controller	Internal TwinCAN module (two CAN channels)
CAN bus interface	ISO/IS 11898-2 and ISO/IS 11898-3, Sub D9 connector according to DS 102, galvanic decoupled and high-/low-speed bus interface switchable via software
Power supply	5 V DC, 100 mA typ.; 3.3 V DC, 120 mA typ.
Temperature range	-20 °C to +70 °C
Certification	CE, FCC
Size	Approx. 74 x 149 mm single CMC

CONTENTS OF DELIVERY

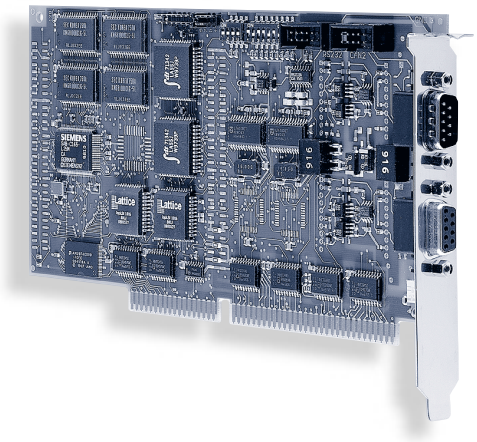
- PC/CAN interface card and manual
- CAN driver VCI for Windows 2000/XP
- Simple CAN monitor "miniMon"

ORDER NUMBER

1.01.0049.33660	iPC-I XC16/PMC, 2 x internal CAN controller, 2 x High/Low-speed bus interface, 2 x galvanic decoupled

iPC-I 165

Intelligent CAN interface for ISA bus systems



This is a powerful and economic solution covering a wide range of CAN applications requiring an active CAN board with one or two CAN channels. Some of the features offered by the on-board microcontroller include filtering, preprocessing, transmission and time stamped storage of the CAN messages. Due to the powerful microcontroller, both CAN controllers can operate simultaneously without losing any data, even in systems with a high bus load.
In combination with the CAN driver (VCI, part of delivery), the iPC-I 165 allows an easy integration of PC supported CAN applications. In addition, the iPC-I 165 is well-suited for use both with the IXXAT analysis and configuration tools and as a CANopen network controller.

TECHNICAL DATA

PC bus interface	ISA-Bus, 16 Bit
PC address range	C000h-FE00h (memory mapped), adjustable in 16 kB steps
Interrupts	IRQ 3, 4, 5, 7, 9, 10, 11, 12, 14, 15
Microcontroller	Infineon SAB C165, 20 MHz
Memory extension	512 kByte SRAM, 512 kByte Flash, 8 kByte DPRAM
CAN controller	Up to two Philips SJA 1000
CAN bus interface	ISO/IS 11898-2, Sub D9 connector according to DS 102, optional galvanic decoupling
Power supply	5 V DC, 250 mA typ., provided by PC
Temperatur range	0 °C to +50 °C
Certification	CE, CSA/UL
Size	Approx. 110 x 220 mm

ORDER OPTIONS

- Galvanic decoupled

CONTENTS OF DELIVERY

- PC/CAN interface card and manual
- CAN driver VCI for Windows 2000, XP
- Simple CAN monitor "miniMon"

ORDER NUMBER

1.01.0045.10200	iPC-I 165, 1 x SJA1000 CAN controller, 1 x CAN interface, 1 x galvanic decoupled
1.01.0045.11110	iPC-I 165, 2 x SJA1000 CAN controller, 2 x CAN interface
1.01.0045.11220	iPC-I 165, 2 x SJA1000 CAN controller, 2 x CAN interface, 2 x galvanic decoupled

tinCAN161

Intelligent CAN Board for PC-Card Bus Systems (PCMCIA)

This powerful active CAN board comes with two CAN channels in a PC-card format.
It has a high-speed and a high-/low-speed bus interface switchable via software and therefore, is ideal for use in the industrial and automotive sector.
The 16-bit microcontroller system of tinCAN161 enables filtering, pre-processing and saving of received CAN messages with time-stamp, even under high bus loads.
With the universal CAN driver VCI also included in the delivery, tinCAN161 also allows simple integration of PC-supported applications in CAN systems. In conjunction with the canAnalyser, it is the ideal solution for a powerful mobile tool for analysis, start-up and configuration of CAN systems.

TECHNICAL DATA

PC bus interface	PC card version 4 (PCMCIA), 16-bit board
PC address range	Plug & Play
Interrupts	Plug & Play
Microcontroller	Infineon SAB C161, clocked with 25 MHz
Memory extension	1 MByte SRAM, 512 kByte Flash, 8 kByte DPRAM
CAN controller	2 x Philips SJA 1000
CAN bus interface	1 x ISO/IS 11898-2, 1 x 11898-2 / 11898-3 switchable, 2 x Sub D9 connectors according to DS 102, galvanically decoupled
Power supply	5 V DC, typically 400 mA, provided by PC
Temperature range	0 °C to +55 °C
Certification	CE
Size	PC card type II, bus connection in external housing, 54 x 86 x 5.5 mm

CONTENTS OF DELIVERY

- PC/CAN interface card and manual
- CAN driver VCI for Windows 2000/XP
- Simple CAN monitor "miniMon"

ORDER NUMBER

1.01.0026.00020	tinCAN161 – with one High-Speed and one High-/Low-Speed bus interface, 2 x galvanic decoupled

USB-to-CAN compact

Intelligent low-cost CAN interface for the USB-Port

The USB-to-CAN compact is a low-cost, active CAN module for connection to the USB bus. The 16-bit microcontroller system enables reliable, loss-free transmission and reception of messages in CAN networks with both a high transmission rate and a high bus load. In addition, messages are provided with a time-stamp and can be filtered and buffered directly in the USB-to-CAN compact. The module can also be used as a master assembly, e.g. for CANopen systems. Together with the universal CAN driver VCI supplied with the delivery, the USB-to-CAN compact allows the simple integration of PC-supported applications into CAN systems.

Combining an extremely attractive price with compact construction, the USB-to-CAN compact is ideal for use in series products and in conjunction with the canAnalyser for development, service and maintenance work.

TECHNICAL DATA

PC bus interface	USB, Version 2.0 (full speed)
PC address range	Plug & Play
Interrupts	Plug & Play
Microcontroller	Infineon C161U, 24 MHz
Memory extension	128 kByte RAM, 512 kByte Flash
CAN controller	Philips SJA 1000, 10 kBit/s to 1 MBit/s
CAN bus interface	ISO/IS 11898-2, Sub D9 connector or RJ45 connector according to DS 102, galvanically decoupled as an option
Power supply	Provided by USB port, 250 mA typ
Temperature range	0 °C to +50 °C
Certification	CE, FCC, CSA/UL
Size	Approx. 80 x 45 x 20 mm

ORDER OPTIONS

- Galvanic decoupled

VERSIONS

- With Sub D9 plug according to DS102
- With RJ45 plug according to DS102

CONTENTS OF DELIVERY

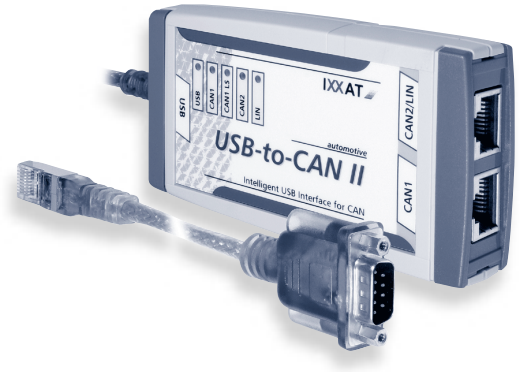
- CAN interface, user's manual
- CAN driver VCI for Windows 2000, XP
- Simple CAN monitor "miniMon"

ORDER NUMBER

1.01.0087.10100	USB-to-CAN compact (with SUB-D9 plug)
1.01.0087.10200	USB-to-CAN compact, with galvanic isolation (with SUB-D9 plug)
1.01.0088.10100	USB-to-CAN compact (with RJ45 plug)
1.01.0088.10200	USB-to-CAN compact, with galvanic isolation (with RJ45 plug)

USB-to-CAN II

▶ Intelligent CAN/LIN Interface for the USB Port



This active interface offers two CAN channels and one LIN channel (automotive version) for connection to the USB bus.

With its powerful 16-bit microcontroller system, the interface allows filtering, pre-processing and saving of received messages. Transmission and reception processes can be controlled loss-free even with a high transmission rate and bus load.

Together with the universal CAN driver VCI also supplied with the delivery, the USB-to-CAN II module allows for the simple integration of PC-supported applications into CAN systems. In conjunction with the canAnalyser from IXXAT, USB-to-CAN II is a convenient, mobile analysis and development tool. The interface can also be used as a master assembly, e.g., for CANopen systems with many subscribers.

TECHNICAL DATA

PC bus interface	USB, version 2.0 (full speed)
PC address range	Plug & Play
Interrupts	Plug & Play
Microcontroller	Infineon 161u, 36 MHz
Memory extension	512 kByte RAM, 512 kByte Flash
CAN controller	Two Philips SJA 1000
CAN bus interface	2 x RJ45 connector with RJ45 on Sub-D9 adapter line (10 cm), galvanically decoupled as an option **Industrial version:** 2 x ISO/IS 11898-2 **Automotive version:** 1 x ISO/IS 11898-2, 1 x ISO/IS 11898-2 and 11898-3 switchable via software, 1 x LIN master/slave switchable via software (VCI V3)
Power supply	5 V, 400 mA max. via USB
Temperature range	-20 °C to +80 °C
Certification	CE, FCC, CSA/UL
Size	98 x 55 x 20 mm

ORDER OPTIONS

- Automotive/Industrial Version
- Galvanic decoupling

CONTENTS OF DELIVERY

- CAN module, user's manual
- CAN driver VCI for Windows 2000, XP
- Simple CAN monitor "miniMon"

ORDER NUMBER

1.01.0062.11110	USB-to-CAN II – Industrial Version
1.01.0062.11220	USB-to-CAN II – Industrial Version with galvanic isolation
1.01.0066.11220	USB-to-CAN II – Automotive Version with galvanic isolation

CAN@net II/VCI

▶ Intelligent CAN Adapter with Ethernet Interface

The CAN@net II allows simple, flexible access from a PC to CAN systems via Ethernet. Because of its ability to support the TCP/IP protocol, the CAN@net II allows for worldwide direct connection to a PC, implementation in an LAN, or, communication with the gateway via the Internet. The main area of application of the CAN@net II is to provide remote access to CAN systems requiring both service and remote maintenance.

With the VCI CAN driver included in the delivery, the CAN@net II can be operated in the same way as all IXXAT CAN PC interface boards. Therefore, all VCI-based CAN-programs and tools can be run with the CAN@net II. The VCI CAN driver is also capable of communicating via a PC with up to 128 CAN@net II devices simultaneously.

In addition to the CAN@net II/VCI, IXXAT also offers the CAN@net II/Generic interface, which is addressed via a standard TCP/IP socket interface. This makes it possible to connect CAN@net II to any processor and operating system platforms (see also CAN@net II/Generic interface in the section "CAN gateways").

TECHNICAL DATA

Ethernet-Interface	10/100 Mbit/s Ethernet (10-Base T/100-base T), Autodetect, Connector RJ45, Auto crossover
IP address allocation	DHCP, via PC tool
Microcontroller	Freescale MCF5235, 150 MHz
Memory extension	8 MByte DRAM, 4 MByte Flash
CAN controller	1 x SJA1000
CAN bus interface	ISO/IS 11898-2, Sub D9 connector according to DS102, galvanically decoupled
Power supply	9-32 V DC, 3 W
Size	22.5 x 100 x 115 mm
Housing	Plastic housing for top hat rail mounting
Temperature range	-20 °C to +70 °C
Certification	CE, FCC, CSA

CONTENTS OF DELIVERY

- CAN@net II/VCI, user's manual
- CAN driver VCI for Windows 2000, XP
- Simple CAN monitor "miniMon"

ORDER NUMBER

1.01.0086.10200	CAN@net II/VCI – Intelligent CAN module with Ethernet interface

CANblue/VCI

Intelligent CAN Module with Bluetooth Interface

The CANblue/VCI is a CAN module that is connected to the PC wirelessly via Bluetooth. It is ideal for servicing and accessing CAN systems that are otherwise difficult to access.

Depending on the space limitations, the maximum distance between the CANblue and the PC/notebook can be up to 100 m.

Because it is supported by the VCI CAN driver, the CANblue/VCI can be operated with all IXXAT tools and with customer-specified programs. In addition, wireless access to CAN systems via Bluetooth can also be easily achieved with existing VCI-based application programs and tools.

TECHNICAL DATA

Bluetooth interface	Bluetooth specification V2.0, Class 1 / +16,9 dBm (49 mW), 100m
Microcontroller	Infineon C161U, 36 MHz
Memory extension	256k Flash, 128k RAM
CAN controller	1 x SJA1000
CAN bus interface	ISO/IS 11898-2 (High Speed) and ISO/IS11898-3 (Low-Speed), switchable, Sub D9 plug according to DS102, galvanic decoupled
Power supply	9-30 V DC, 2.5 W
Housing	Stable metal housing
Temperature range	0 °C to +55 °C
Certification	CE
Size	88 x 72 x 35 mm

CONTENTS OF DELIVERY

- CANblue module and user's manual
- CAN driver VCI for Windows 2000, XP
- Simple CAN tool "miniMon"

ORDER NUMBER

1.01.0125.00000	CANblue/VCI